

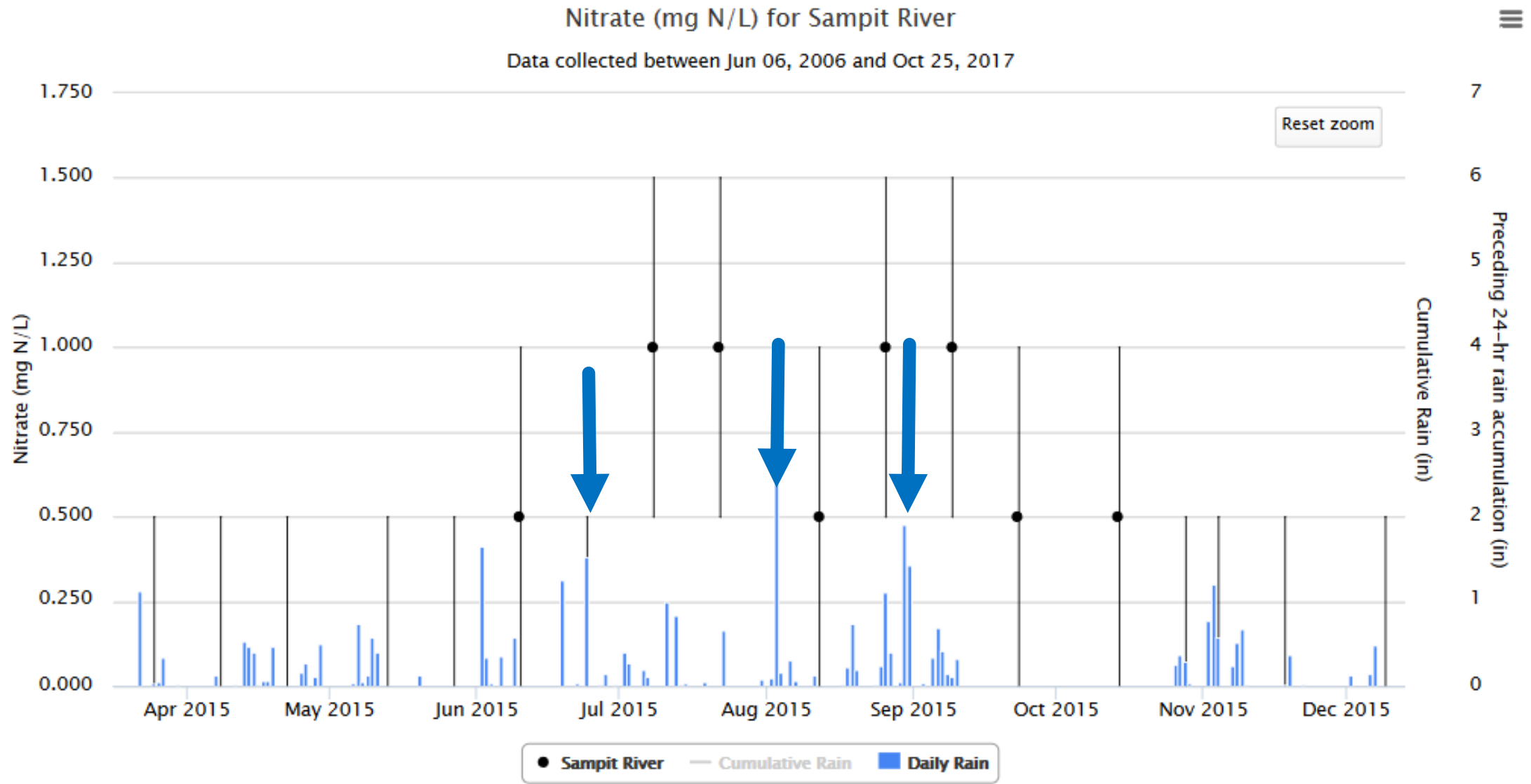


Hach's Upgraded (?!) Nitrate Strips

Presented By:

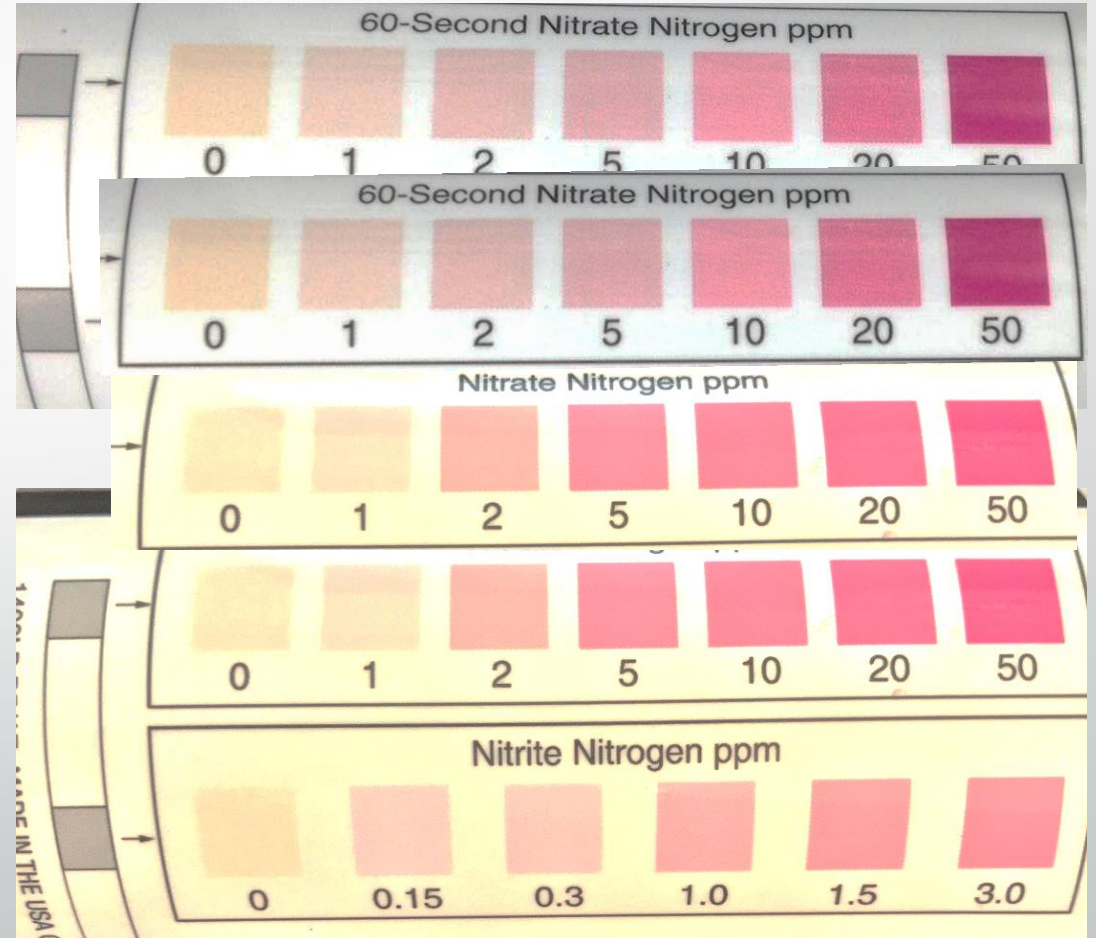
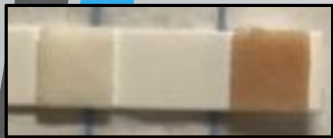
AJ Taylor and Kelly Hall

Nitrate and Rainfall



New Color Chart

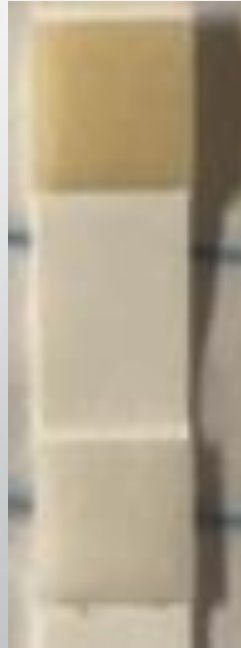
- Hach recently revised the Nitrate strip color chart to be more distinguishable at lower concentrations
- This is good for us, since we typically Nitrate concentrations between 0 to 1 ppm in our samples!
- However, the Nitrate strips behaved a little differently out in the field than what was expected
- The Nitrite pad of the strip was not at all



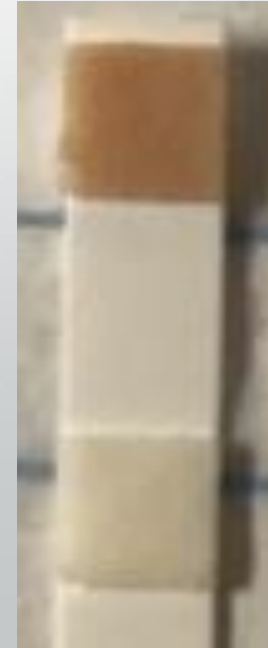
What's happening with the strips?

- We believe humidity is altering the color of the Nitrate strips while they're stored in the bottle, which is why some are turning dark brown.
- We have noticed that during storage some of the Nitrate strips will remain the lighter tan color longer than others will.
- Initially we thought the brown strips should be considered “contaminated” and thrown away.

Non-Discolored Strip



Discolored Strip



Are the brown strips usable?

- We did a comparison between the non-discolored strips and the discolored (brown) strips
- We used Deionized water as our control
- We also used five test solutions at various concentrations (0.5 ppm, 1 ppm, 2 ppm, 3 ppm, and 5 ppm)
- We then dipped one of each strip into each of the solutions
- We also took pictures of the strips every 30 seconds up to a 4 minute mark to determine how long it took for the nitrate pad to turn a definitive color

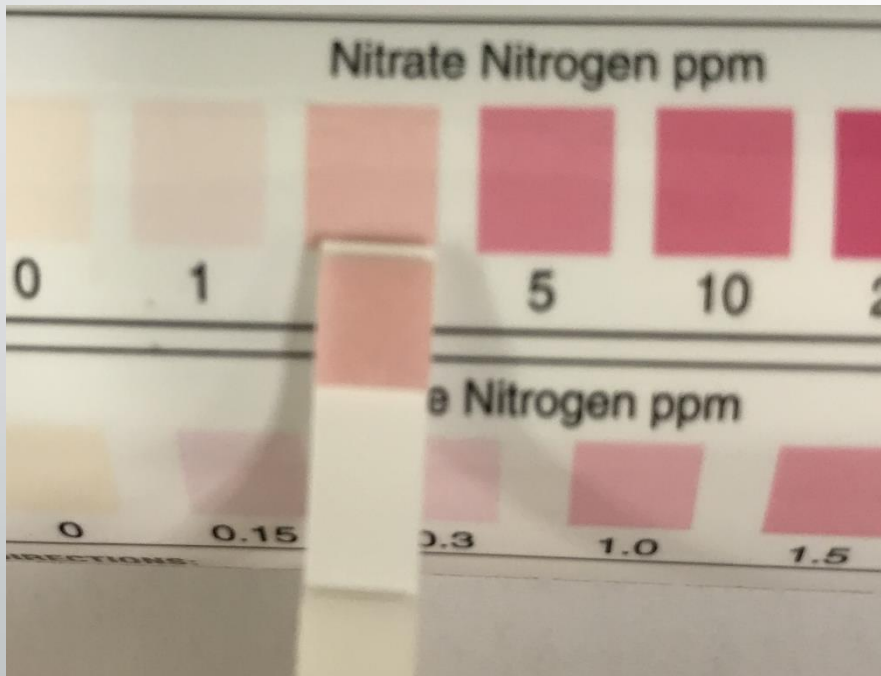
The Results



Non-Discolored Strips

- The normal, non-discolored strip matched the zero color on the bottle after it was dipped into deionized water
- The picture to the left is when we dipped another non-discolored strip into the 1 ppm N test solution

The Results



2 ppm test solution

- The non-discolored test strip also matched perfectly to the color chart when dipped into the 2 ppm test solution
- Currently, 2 ppm is the maximum nitrate reading ever recorded from this method on the Waccamaw River

The Discolored Strip Results



The control

- After dipping the discolored Nitrate strip into the deionized water, the strip remained that same dark brown color throughout the entire 4 minutes

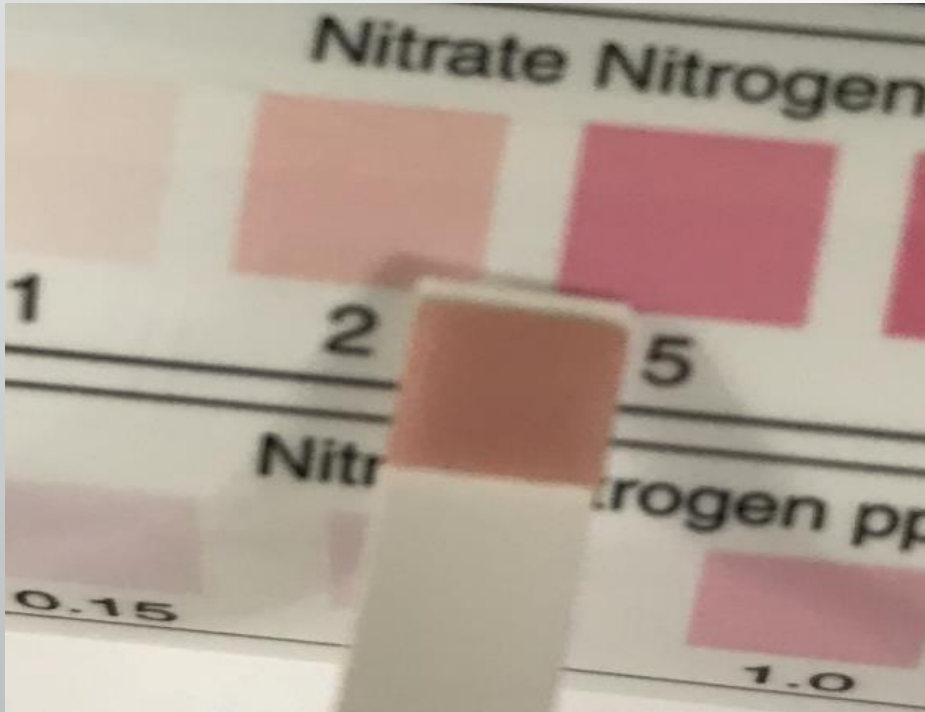
The Discolored Strip Results



1 ppm test solution

- After dipping the discolored Nitrate strip into the 1 ppm N test solution, the strip did change colors, indicating the strip does have the ability to detect nitrate even when discolored
- However, the strip matched more closely the color associated with a 2 ppm Nitrate concentration than the 1 ppm concentration

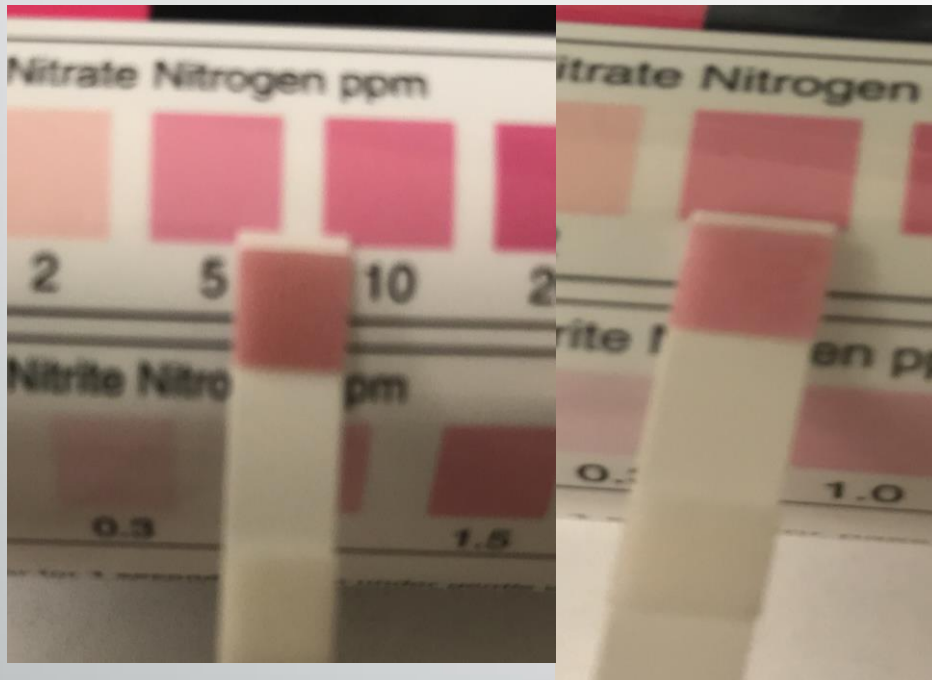
The Discolored Strip Results



2 ppm test solution

- After dipping the discolored Nitrate strip into the 2 ppm N test solution, the strip once again changed color
- However, the strip matched somewhere in between the 2 and 5 ppm color scale

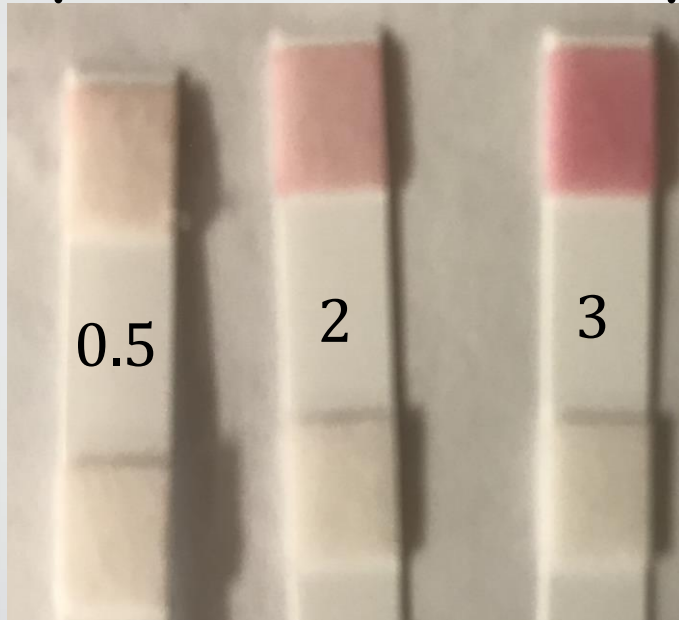
The Discolored Strip Results



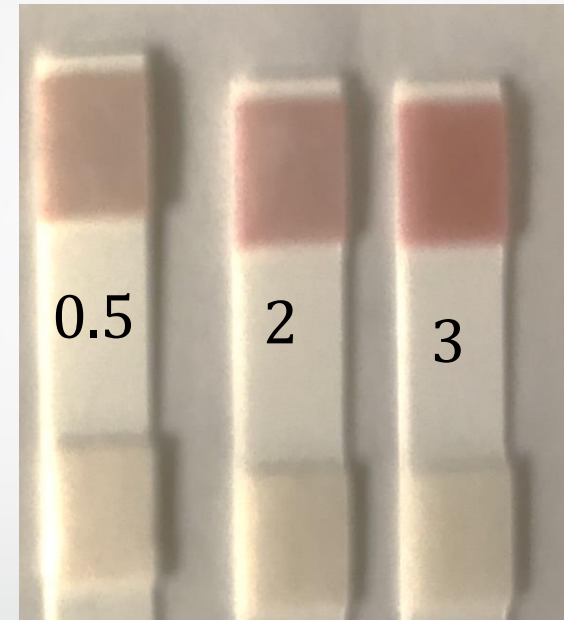
5 ppm test solution

- After dipping the discolored Nitrate strip into the 5ppm N test solution, the strip once again changed color
- However, the strip matched somewhere in between the 5 and 10 ppm color scale
- At higher concentrations, the discolored strip starts to match the scale better, but as you can see still does not match the non-discolored strip

Non-Discolored Strips



Discolored Strips



- Non-discolored strips which were dipped into 0.5, 2, and 3 ppm test solutions


- Discolored strips which were dipped into 0.5, 2, and 3 ppm test solutions

For now

- If the dry strips appear normal, they will work just fine.
- Whether or not the strips are discolored, wait at least 3 minutes before comparing the strip to the color chart on the bottle
- If your strip is discolored:
 - The pad will remain dark brown if your sample does not have any nitrate. Record as a “0” on your data sheet and enter “0” into the database.
 - If the pad develops any pink color, nitrate was detected. Record as a “>1 ppm” on your data sheet. Enter “1” into the database.

Moving Forward

- We are working with the manufacturer to try and resolve this discoloration issue
- In the meantime, please perform the Nitrate/Nitrite test indoors with leftover sample water
- The Nitrate/Nitrite bottle should be left indoors to minimize exposure to humid air.
- The Ammonia strips can continue to be used in the field
- Any Questions???



This is a low-cost semi-quantitative screening tool!